

# CMS Draft Analysis Note

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## Update on the search in the $lljj$ final states at $\sqrt{s} = 8$ TeV

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### Abstract

This is an example of a CMS *Note* written in L<sup>A</sup>T<sub>E</sub>X using the *cms-tdr* document class and processed using the same *tdr* perl script used in generating the CMS Physics TDRs. Instructions for producing CMS Notes and Internal Notes are given.

This box is only visible in draft mode. Please make sure the values below make sense.

PDFAuthor: George Alverson, Lucas Taylor, A. Cern Person

PDFTitle: Update on the search in the  $lljj$  final states at  $\sqrt{s} = 8$  TeV

PDFSubject: CMS

PDFKeywords: CMS, physics, software, computing

Please also verify that the abstract does not use any user defined symbols



## 1 CMS papers

2 There are currently three kinds of CMS papers supported by this system in addition to tdrs:  
 3 “CMS Analysis Note,” “CMS Physics Analysis Summary,” and “CMS Paper.” The processing  
 4 for these differs only in the header of the first page, which includes a different PDF figure for  
 5 each kind. The appropriate header is chosen by the switch used in the `tdr` command.

6 This document only deals with papers set with PdfL<sup>A</sup>T<sub>E</sub>X. We found PdfL<sup>A</sup>T<sub>E</sub>X plus `cvs` to be  
 7 a reliable system for the production of large documents such as the Physics TDRs and felt it  
 8 would be useful to extend it to the production of shorter documents such as CMS Notes. As of  
 9 2010 `cvs` has been replaced by subversion (`svn`).

### 10 1.1 The mechanics of generating and typesetting papers

11 To start you will need to request a note directory in the `svn` repository from the TDR manager  
 12 (currently George Alverson or Lucas Taylor). It is best to supply a list of the lxplus usernames  
 13 of the co-authors who are to have write access to the repository at the time of the request.

14 To generate output, check out your note directory from `svn` following the example below. The  
 15 `tag` below is the identifier for your paper, typically of the form XXX-YY-NNN. Following the  
 16 sequence below will populate your local copy of the repository with only your note and not in-  
 17 clude the other notes. If you have a note, use “note”. For a paper, use “paper.” [Notes: (1) When  
 18 running without Kerberos authentication, use `svn+ssh://username@svn.cern.ch`. (2) At Fer-  
 19 milab, even using `kinit user@CERN.CH` is not sufficient without specifying a specific `svn`  
 20 server node (i.e., 137.138.229.205) instead of `svn.cern.ch`.]

```
21 > svn co -N svn+ssh://svn.cern.ch/repos/tdr2 myDir
22 > cd myDir
23 > svn update utils
24 > svn update -N [papers|notes]
25 > svn update [papers|notes]/XXX-YY-NNN
26 # use the following line for tcsh...
27 # ..use -sh for bash:
28 > eval '[papers|notes]/tdr runtime -csh'
29 > cd [papers|notes]/XXX-YY-NNN/trunk
30 # (edit the template, then to build the document)
31 > tdr --style=[paper|pas|an|note] b XXX-YY-NNN
```

32 The `nodraft` switch is required to turn off the “Draft” overlay text.

33 If you wish to export your paper (for local work or for security), you can produce a tarball with  
 34 all the necessary files with

```
35 > tdr --style=note --export b mynote.
```

36 This will function on Unix or Windows systems which have recent copies of L<sup>A</sup>T<sub>E</sub>X (includ-  
 37 ing *AMS-L<sup>A</sup>T<sub>E</sub>X*) and perl installed. We currently use the `sectsty`, `subfig`, `fancyhdr`,  
 38 `mathpazo`, `rotating`, `fancybox`, `lineno`, `longtable`, `ifthen` and `natbib` styles,  
 39 which may not be included in the default distribution, plus our own versions of `pdfdraftcopy`  
 40 and the `pennames` particle name macros. The latter has been modified for use with the fonts  
 41 required by our standard style and also to provide for automatic switching to an italic version  
 42 when necessary.

## 43 2 svn commands

44 svn is similar in many ways to cvs. Once a repository has been checked out, the workflow is  
 45 almost identical except for tagging. In svn, tagging is done by creating a new directory branch  
 46 using the svn copy command. Please see the svn manual for details, particularly the chapter  
 47 on branching and tagging and svn for cvs users. Please do not change the depth of the directory  
 48 structure to the top-level TeX file for your document.

49 Please make sure to configure your svn client: edit `~/.subversion/config` so that it appropri-  
 50 ately tags pdf and other commonly used file types.

```
51 [auto-props]
52 *.pdf = svn:mime-type=application/pdf
53 *.png = svn:mime-type=image/png
54 *.jpg = svn:mime-type=image/jpeg
55 *.tex = svn:eol-style=native
56 *.eps = svn:mime-type=application/postscript
```

57 There are other useful settings as well. For example, to stop svn from asking to commit backup  
 58 files and object files, you can set the global-ignores flag:

```
59 [miscellany]
60 global-ignores = *.o *.bak
```

## 61 3 Document layout

### 62 3.1 Standard macros

63 Notes will automatically include `ptdr-definitions.sty`, which provides definitions for  
 64 many physics and CMS-related entities, e.g.,  $\text{GeV}/c^2$ . These are discussed in more detail in  
 65 section 4.4, and a complete list is given the Appendix.

66 All style-related parameters are set in the class file included by the script and generally follow  
 67 the article style. The chapter command is not implemented.

### 68 3.2 Title block

69 Please see the `LATEX` source for this file to see how the title page is generated. In general it  
 70 follows the normal `LATEX` practice for title pages.

71 The type of note (PAS, AN, Note, etc.) is set through the `--style` switch in the `tdr` script.  
 72 When in draft mode, the string "Draft" is displayed on the page and the title block contains (in  
 73 addition to the date), information about the svn status of the document and the PDF metadata.

74 For ANs which need to differentiate between primary and non-primary authors, using the star  
 75 form of the author macro will add a footnote to indicate a primary author:  
 76 `\author{*{A. Cern Person}}`.

### 77 3.3 Page size, margins and fonts

78 The standard European paper size is A4 (210 mm  $\times$  297 mm (8.3"  $\times$  11.7")) while American  
 79 paper is US Letter (216 mm  $\times$  279 mm (8.5"  $\times$  11.0")), somewhat wider and shorter. In the era of  
 80 straight PostScript this led to difficulties, but PDF print drivers now generally supply a "shrink

and center" option. In this template we have set the L<sup>A</sup>T<sub>E</sub>X page style parameters to match the standard A4 size (see Table 1) and rely upon that option to produce an acceptable result on US Letter paper.

Do not override the default fonts. They are currently set to be Palatino and Helvetica. The math fonts have also been changed to Palatino so that they do not clash with the body text, particularly in regards to numbers and units. This means the authors should use `\text` commands to put text in subscripts and superscripts, and most importantly *do not use \rm* in formulas with Greek symbols, otherwise you will end up with formulae looking like the second one below.

$$\phi = \text{a Greek letter} \tag{1}$$

$$\text{Œ} = \text{a mistake} \tag{2}$$

Also note that the math fonts include a full set of Greek symbols in Math Italic Bold (produced with `\mathbold`), but only uppercase in Math Bold (`\mathbf`). Use either `\boldsymbol` or `\boldmath` outside the math delimiters (\$) (but inside braces) to get bold symbols. Compare:

<code>\$\mathbold{\Psi \alpha}\$</code>	<b><math>\Psi\alpha</math></b>
<code>\$\mathbf{\Psi \alpha}\$</code>	<b><math>\Psi\mathbf{\alpha}</math></b>
<code>\$\Psi \otimes \beta\$</code>	$\Psi \otimes \beta$
<code>\$\boldsymbol{\Psi \otimes \beta}\$</code>	<b><math>\Psi \otimes \beta</math></b>

Note, however, that `\mathbold` will not work for most journal styles.

When Greek or symbol characters are used in the title, author, keywords or section heads, please use the `\texorpdfstring` command to provide alternate versions. Acrobat cannot deal with T<sub>E</sub>X characters and will ignore many of them for your PDF bookmark. See the following two subsections and check the corresponding bookmarks. (You may notice that this will produce four instances of "Package hyperref Warning: Token not allowed in a PDFDocEncoded string" in the output log.)

## 3.4 H<sub>2</sub>O- $\alpha$ Demo

The title for this subsection was set with

```
\subsection{\texorpdfstring{H$\alpha$}{Water-alpha}}
```

The use of `\text` sets the numeral 2 in the same font and weight as the rest of the title (here Helvetica bold).

## 3.5 H<sub>2</sub>O- $\alpha$ demo

The title for this subsection was set with

```
\subsection{H$_2$O-$\alpha$}.
```

## 3.6 Tables, figures

Place the captions above the object for tables and use `topcaption`, below for figures using `caption`. To force a full width figure or table in the two-column mode of most journal reprint formats, use `\textwidth` as the unit along with the starred versions of the commands:

```
\begin{figure*}[htbp]\begin{center}
\includegraphics[width=0.95\textwidth]{CMS-bw-logo}
```

```
114 \caption{Figures inserted using includegraphics.}
115 \label{fig:ex1}\end{center}\end{figure*}
```

Table 1: An example table: Current page and paragraph layout parameters. ( 72.27 pt = 1 in )

\hoffset	0.0pt	\voffset	0.0pt
\textheight	668.63976pt	\textwidth	455.24408pt
\baselineskip	0.0pt	\marginparsep	8.53581pt
\topmargin	-8.0pt		
\headheight	25.0pt	\footskip	36.0pt
\oddsidemargin	0.0pt	\evensidemargin	0.0pt
\columnwidth	455.24408pt	\linewidth	455.24408pt

116 Figures can include PDF files using the `includegraphics` package, which is automatically  
 117 installed by our class file. A nice feature is that if a file extension is not supplied, `includegraphics`  
 118 supplies an appropriate one based on whether the file is being PdfLATEXed or just LATEXed. The  
 119 package also can accept sizes to which the figures will be scaled. Specifying both width and  
 120 height forces both dimensions to be changed and causes a distortion of the figure, however,  
 121 so only use one of the two. Don't try to use scaling to correct a bad original aspect ratio. If  
 122 neither width nor height is given, the size is taken from the Crop Box size embedded in the  
 123 file, which is similar to the BoundingBox in PostScript. If there is too much white space around  
 124 your figure, it may be that the Crop Box has been mis-set during a conversion from PostScript  
 125 to PDF. Recommended translators on lxplus are `epstopdf` and `ps2pdf -dEPSCrop`. Native  
 126 PostScript can not be included.

127 The `subfig` package is included and can be used for PASs and ANs (but not papers) to generate  
 128 (a), (b), etc. labels under the subfigures through the use of the `subfloat` command. We  
 129 have aliased `subfigure` to `subfloat` to avoid breaking older documents which may have  
 130 depended on the `subfigure` package, but the spacing will not necessarily be the same. You  
 131 may need to add line breaks by hand.

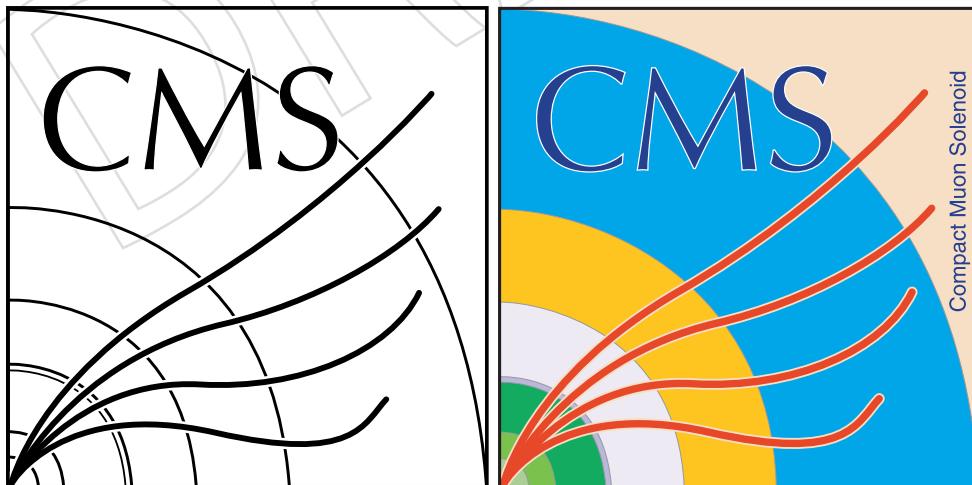


Figure 1: Figures inserted using `includegraphics`. (left) Black and white. (right) Color.

132 When including root-generated figures, please make sure to use the standard macro to set  
 133 the figure parameters, and to first generate the output in eps format which is then converted

134 to PDF. The macro for TDR styles, `tdrstyle.C`, is available in the `utils/general` directory. For producing standard CMS figures for publication, the additional files `CMS_lumi.h`, 135 and `CMS_lumi.C` are also present, as well as an example, `myMacro.C` and `histo.root`. Instructions for their proper use are currently available at <https://ghm.web.cern.ch/ghm/plots>.

139 The non-vector file types `png` and `jpg` are also picked up if present. Vector graphics is preferred 140 except in cases such as scatter plots with millions of points. A screen grab saved as `pdf` is not 141 vector graphics. In all cases, figures intended for publication should be publication quality.

142 As a result of the file-tracking we use for export, please keep the length of the graphics files (including 143 any subdirectory names and the period plus extension, which is not normally entered) 144 shorter than 65 characters.

## 145 4 Standards

146 Please check the *CMS Guidelines for Authors* and the *Notes for TDR authors* for authoritative 147 information on CMS standards for publications and for tips on writing in  $\text{\LaTeX}$ . (If you find 148 any discrepancies between those documents and the practices in this example, please contact 149 us.)

### 150 4.1 Math

151 *Notes* include the  $\mathcal{AM}\text{\LaTeX}$  class file which defines many additional math symbols, including 152 `\gtrsim` ( $\gtrsim$ ). It also allows for better control in setting equations. Please see the  $\mathcal{AM}\text{\LaTeX}$  153 user guide for complete details.

154 As previously mentioned, uniformity of symbol use should be enforced through use of the definitions 155 in `ptdr-definitions`.

156

### 157 4.2 Figure style

158 Figures must have legible axis labels and values, symbol names, and line types when read at 159 the final design size. For tdr-style documents, this is enforced through the use of the root macro 160 file, `tdrstyle.C`, as discussed in Section 3.6.

### 161 4.3 Particle names: $Z^0$ to $J/\psi(1S)$

162 Most standard particle names can be typeset using the `pennames-pazo` package, which 163 is an implementation of the PENNAMES (Particle Entity Names) scheme adapted by us for 164 use with Palatino/mathpazo fonts, as far as possible. The advantage is that the formatting 165 will mostly adhere to particle naming conventions for typesetting (no, particle names are not 166 mathematical symbols—they’re more like units).

### 167 4.4 CMS macros

168 Macros introduced by CMS are listed in Appendix A. The macros for units are particularly 169 useful, especially as they include the proper spacing between the magnitude and the unit (a 170 thinspace), and they have an `xspace` at the end, which removes the necessity of ending them 171 with a pair of braces. Thus, use a momentum of  $5\,\text{TeV}/c$  was measured to produce “a 172 momentum of  $5\,\text{TeV}/c$  was measured.”

## 173 5 Submitting a note

174 Please follow the rules and procedures defined on the iCMS server or on the CMS wiki page for  
175 analysis notes and other CMS note types. For PAS documents or papers intended for journals,  
176 the CADI analysis management page controls submission.

## 177 6 References example

178 References ([1–11]) should use standard BibTeX citations and be placed in a separate bib file.  
179 This is automatically included by the `\bibliograph{auto_generated}` command placed  
180 at the end of the note. We recommend the use of [inspirehep.net](#) (SPIRES) identifiers as reference  
181 keys, where possible. This allows the reference to be easily found on Spires using the `find texkey`  
182 command. It also ensures uniqueness if the references are to be combined into a larger bib file  
183 later. Note, however, that Spires tends to classify all bibliographic entities as Articles. Entities  
184 such as arXiv postings do not have an associated journal, though, and should be entered in the  
185 bib file as Unpublished. See the bib file for this note for examples, including the correct use of  
186 hyperlinks (all references should be linked when possible). Some journal styles will lowercase  
187 the titles in references, so use curly braces (`{ }`) to escape proper names and the like. Don't  
188 escape the entire title gratuitously. Direct references (e.g., see Ref. 7), may use the `\citem`  
189 form of `\cite`.

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## References

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## A PTDR symbol definitions

If absolutely necessary, symbol definitions may be over-ridden using the \renewcommand command. If you don't want to over-ride the default version of a command but provide it for use outside the normal tdr system, please use the \providecommand command.

etal:	et al.	306	HDECAY:	HDECAY
ie:	i.e.	307	HERWIG:	HERWIG
eg:	e.g.	308	HERWIGpp:	HERWIG++
etc:	etc.	309	POWHEG:	POWHEG
vs:	vs.	310	HIGLU:	HIGLU
mdash:	—	311	HIJING:	HIJING
Lone:	Level-1	312	IGUANA:	IGUANA
Ltwo:	Level-2	313	ISAJET:	ISAJET
Lthree:	Level-3	314	ISAPYTHIA:	ISAPYTHIA
ACERMC:	ACERMC	315	ISASUGRA:	ISASUGRA
ALPGEN:	ALPGEN	316	ISASUSY:	ISASUSY
CALCHEP:	CALCHEP	317	ISAWIG:	ISAWIG
CHARYBDIS:	CHARYBDIS	318	MADGRAPH:	MADGRAPH
CMKIN:	CMKIN	319	MCATNLO:	MC@NLO
CMSIM:	CMSIM	320	MCFM:	MCFM
CMSSW:	CMSSW	321	MILLEPEDE:	MILLEPEDE
COBRA:	COBRA	322	ORCA:	ORCA
COCOA:	COCOA	323	OSCAR:	OSCAR
COMPHEP:	COMPHEP	324	PHOTOS:	PHOTOS
EVTGEN:	EVTGEN	325	PROSPINO:	PROSPINO
FAMOS:	FAMOS	326	PYTHIA:	PYTHIA
FEWZ:	FEWZ	327	SHERPA:	SHERPA
GARCON:	GARCON	328	TAUOLA:	TAUOLA
GARFIELD:	GARFIELD	329	TOPREX:	TOPREX
GEANE:	GEANE	330	XDAQ:	XDAQ
GEANTfour:	GEANT4	331	DZERO:	D0
GEANTthree:	GEANT3	332	de:	°
GEANT:	GEANT	333	ten{x}:	$\times 10^x$

334	unit{x}:	x	369	ddinline{y}{x}:	dy/dx
335	mum:	$\mu\text{m}$ [Most units include leading thinspace]	390	rd:	d
336	micron:	$\mu\text{m}$	391	re:	e
337	cm:	cm	392	abs{x}:	x
338	mm:	mm	393	zp:	$Z'$
339	mus:	$\mu\text{s}$	394	JPsi:	$J/\psi$
340	keV:	keV	395	Z:	Z
341	MeV:	MeV	396	ttbar:	$t\bar{t}$
342	MeVns:	MeV [no leading thinspace with ns suffix]	397		
343	GeV:	GeV	398	Extensions to PENNAMES	
344	GeVns:	GeV	399	cPgn:	$\nu$
345	gev:	GeV	400	Pgn:	$\nu$
346	TeV:	TeV	401	cPagn:	$\bar{\nu}$
347	TeVns:	TeV	402	Pagn:	$\bar{\nu}$
348	PeV:	PeV	403	cPgg:	$\gamma$
349	keVc:	keV/c	404	cPJgy:	$J/\psi$
350	MeVc:	MeV/c	405	cPZ:	Z
351	GeVc:	GeV/c	406	cPZpr:	$Z'$
352	GeVcn:	GeV/c	407	cPqt:	t
353	TeVc:	TeV/c	408	cPqb:	b
354	keVcc:	keV/c <sup>2</sup>	409	cPqc:	c
355	MeVcc:	MeV/c <sup>2</sup>	410	cPqs:	s
356	GeVcc:	GeV/c <sup>2</sup>	411	cPqu:	u
357	GeVccns:	GeV/c <sup>2</sup>	412	cPqd:	d
358	TeVcc:	TeV/c <sup>2</sup>	413	cPq:	q
359	pbinv:	$\text{pb}^{-1}$	414	cPg:	g
360	fbinv:	$\text{fb}^{-1}$	415	cPG:	G
361	nbinv:	$\text{nb}^{-1}$	416	cPaqt:	$\bar{t}$
362	mubinv:	$\mu\text{b}^{-1}$	417	cPaqb:	$\bar{b}$
363	percms:	$\text{cm}^{-2}\text{s}^{-1}$	418	cPaqc:	$\bar{c}$
364	lumi:	$\mathcal{L}$	419	cPaqs:	$\bar{s}$
365	Lumi:	$\mathcal{L}$	420	cPaqu:	$\bar{u}$
366	LvLow:	$\mathcal{L} = 10^{32}\text{ cm}^{-2}\text{s}^{-1}$	421	cPaqd:	$\bar{d}$
367	LLow:	$\mathcal{L} = 10^{33}\text{ cm}^{-2}\text{s}^{-1}$	422	cPaq:	$\bar{q}$
368	lowlumi:	$\mathcal{L} = 2 \times 10^{33}\text{ cm}^{-2}\text{s}^{-1}$	423	cPKstz:	$K^{*0}$
369	LMed:	$\mathcal{L} = 2 \times 10^{33}\text{ cm}^{-2}\text{s}^{-1}$	424		
370	LHigh:	$\mathcal{L} = 10^{34}\text{ cm}^{-2}\text{s}^{-1}$	425	Future PENNAMES2	
371	hilumi:	$\mathcal{L} = 10^{34}\text{ cm}^{-2}\text{s}^{-1}$	426	PH:	H
372	PT:	$p_T$	427	Ph:	h
373	pt:	$p_T$	428	PJGy:	$J/\psi$
374	ET:	$E_T$	429	PBzs:	$B_s^0$
375	HT:	$H_T$	430	Pg:	$g$
376	et:	$E_T$	431	PSg:	$\tilde{g}$
377	Em:	$E$	432	PSQ:	$\tilde{q}$
378	Pm:	$\not{p}$	433	PXXG:	$G$
379	PTm:	$\not{p}_T$	434	PXXSG:	$\tilde{G}$
380	PTslash:	$\not{p}_T$	435	PSGcp:	$\tilde{\chi}^+$
381	ETm:	$E_T^{\text{miss}}$	436	PSGc:	$\tilde{\chi}$
382	MET:	$E_T^{\text{miss}}$	437	PSGcz:	$\tilde{\chi}^0$
383	ETmiss:	$E_T^{\text{miss}}$	438	PSGczDo:	$\tilde{\chi}_0^0$
384	ETslash:	$\not{E}_T$	439	PSGczDt:	$\tilde{\chi}_0^1$
385	VEtmiss:	$\not{E}_T^{\text{miss}}$	440	PSGcpm:	$\tilde{\chi}^\pm$
386	ptvec:	$\vec{p}_T$	441	PSGcpDo:	$\tilde{\chi}_1^+$
387	ptvecmiss:	$\vec{p}_T^{\text{miss}}$	442	Pl:	l
388	dd{y}{x}:	$\frac{dy}{dx}$	443	PAI:	$\bar{l}$
			444	PGnl:	$\nu_1$

445	PAGnl:	$\bar{v}_1$	500	ccbar:	$c\bar{c}$
446	PQtpr:	$t'$	501	bsspihi:	$B_s \rightarrow J/\psi \phi$
447	PAQtpr:	$\bar{t}'$	502	EE:	$e^+e^-$
448	PQbpr:	$b'$	503	MM:	$\mu^+\mu^-$
449	PAQbpr:	$\bar{b}'$	504	TT:	$\tau^+\tau^-$
450	PGg:	$\gamma$	505	HGG:	$H \rightarrow \gamma\gamma$
451	PKzS:	$K_S^0$	506	GAMJET:	$\gamma + \text{jet}$
452	PBs:	$B_s$	507	PPTOJETS:	$pp \rightarrow \text{jets}$
453	PSQu:	$\tilde{u}$	508	PPTOGG:	$pp \rightarrow \gamma\gamma$
454	PSQd:	$\tilde{d}$	509	PPTOGAMJET:	$pp \rightarrow \gamma + \text{jet}$
455	PSQc:	$\tilde{c}$	510	MH:	$M_H$
456	PSQs:	$\tilde{s}$	511	RNINE:	$R_9$
457	PSQt:	$\tilde{t}$	512	DR:	$\Delta R$
458	PSQb:	$\tilde{b}$	513	ga:	$\gtrsim$
459	PASQt:	$\tilde{t}$	514	la:	$\gtrsim$
460	PASQb:	$\tilde{b}$	515	swsq:	$\sin^2 \theta_W$
461	PSGt:	$\tilde{\tau}$	516	cwsq:	$\cos^2 \theta_W$
462	PZpr:	$Z'$	517	tanb:	$\tan \beta$
463	PGn:	$\nu$	518	tanbsq:	$\tan^2 \beta$
464	PAGn:	$\bar{\nu}$	519	sidb:	$\sin 2\beta$
465	PSQtDo:	$\tilde{t}_1$	520	alpS:	$\alpha_S$
466	PSQtDt:	$\tilde{t}_2$	521	alpt:	$\tilde{\alpha}$
467	PQt:	$t$	522	QL:	$Q_L$
468	PAQt:	$\bar{t}$	523	sQ:	$\tilde{Q}$
469	PQb:	$b$	524	sQL:	$Q_L^C$
470	PAQb:	$\bar{b}$	525	ULC:	$U_L^C$
471	PGm:	$\mu$	526	sUC:	$\tilde{U}_L^C$
472	PGt:	$\tau$	527	sULC:	$\tilde{U}_L^C$
473	PQq:	$q$	528	DLC:	$D_L^C$
474	PQd:	$d$	529	sDC:	$\tilde{D}_L^C$
475	PQu:	$u$	530	sDLC:	$\tilde{D}_L^C$
476	PQs:	$s$	531	LL:	$L_L$
477	PQc:	$c$	532	sL:	$\tilde{L}$
478	PAQq:	$\bar{q}$	533	sLL:	$\tilde{L}_L^C$
479	PAQd:	$\bar{d}$	534	ELC:	$E_L^C$
480	PAQu:	$\bar{u}$	535	sEC:	$\tilde{E}_L^C$
481	PAQs:	$\bar{s}$	536	sELC:	$\tilde{E}_L^C$
482	PAQc:	$\bar{c}$	537	sEL:	$E_L$
483	PGne:	$\nu_e$	538	sER:	$\tilde{E}_R$
484	PAGne:	$\bar{\nu}_e$	539	sFer:	$\tilde{f}$
485	PGnGm:	$\nu_\mu$	540	sQua:	$\tilde{q}$
486	PAGnGm:	$\bar{\nu}_\mu$	541	sUp:	$\tilde{u}$
487	PGnGt:	$\nu_\tau$	542	suL:	$\tilde{u}_L$
488	PAGnGt:	$\bar{\nu}_\tau$	543	suR:	$\tilde{u}_R$
489			544	sDw:	$\tilde{d}$
490	AFB:	$A_{FB}$	545	sdL:	$d_L$
491	wangle:	$\sin^2 \theta_{\text{eff}}^{\text{lept}}(M_Z^2)$	546	sdR:	$d_R$
492	stat:	(stat) [Includes leading thinspace]	547	sTop:	$\tilde{t}$
493	syst:	(syst) [Includes leading thinspace]	548	stL:	$\tilde{t}_L$
494	thy:	(theo) [Includes leading thinspace]	549	stR:	$\tilde{t}_R$
495	lum:	(lumi) [Includes leading thinspace]	550	stone:	$\tilde{t}_1$
496	kt:	$k_T$	551	sttwo:	$\tilde{t}_2$
497	BC:	$B_c$	552	sBot:	$\tilde{b}$
498	bbarc:	$b\bar{c}$	553	sbL:	$\tilde{b}_L$
499	bbbar:	$bb$	554	sbR:	$\tilde{b}_R$
			555	sbone:	$\tilde{b}_1$

556	sbtwo:	$\tilde{b}_2$	563	chipm:	$\tilde{\chi}^\pm$
557	sLep:	$\tilde{l}$	564	Hone:	$H_d$
558	sLepC:	$\tilde{l}^C$	565	sHone:	$\tilde{H}_d$
559	sEl:	$\tilde{e}$	566	Htwo:	$H_u$
560	sElC:	$\tilde{e}^C$	567	sHtwo:	$\tilde{H}_u$
561	sel:	$\tilde{e}_L$	568	sHig:	$\tilde{H}$
562	ser:	$\tilde{e}_R$	569	sHa:	$\tilde{H}_a$
563	snL:	$\tilde{\nu}_L$	570	sHb:	$\tilde{H}_b$
564	sMu:	$\tilde{\mu}$	571	sHpm:	$\tilde{H}^\pm$
565	sNu:	$\tilde{\nu}$	572	hz:	$h^0$
566	sTau:	$\tilde{\tau}$	573	Hz:	$H^0$
567	Glu:	$\tilde{g}$	574	Az:	$A^0$
568	sGlu:	$\tilde{g}$	575	Hpm:	$H^\pm$
569	Wpm:	$\tilde{W}^\pm$	576	sGra:	$\tilde{G}$
570	sWpm:	$\tilde{W}^\pm$	577	mtil:	$\tilde{m}$
571	Wz:	$\tilde{W}^0$	578	rpv:	$\tilde{R}$
572	sWz:	$\tilde{W}^0$	579	LLE:	$LL\bar{E}$
573	sWino:	$\tilde{W}$	580	LQD:	$LQ\bar{D}$
574	Bz:	$\tilde{B}^0$	581	UDD:	$\overline{UDD}$
575	sBz:	$\tilde{B}^0$	582	Lam:	$\lambda$
576	sBino:	$\tilde{B}$	583	Lamp:	$\lambda'$
577	Zz:	$\tilde{Z}^0$	584	Lampp:	$\lambda''$
578	sZino:	$\tilde{Z}^0$	585	MD:	$M_D$
579	sGam:	$\tilde{\gamma}$	586	Mpl:	$M_{Pl}$
580	chiz:	$\tilde{\chi}^0$	587	Rinv:	$R^{-1}$
581	chip:	$\tilde{\chi}^+$	588		
582	chim:	$\tilde{\chi}^-$	589		

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## 610 B Particle symbols

611 PAz:	A <sup>0</sup>	665 PNl:	N(2250)G <sub>19</sub>
612 PBm:	B <sup>-</sup>	666 PNm:	N(2600)I <sub>1,11</sub>
613 PBpm:	B <sup>±</sup>	667 PSHpm:	$\tilde{H}^{\pm_j}$
614 PBp:	B <sup>+</sup>	668 PSHz:	$\tilde{H}^0$
615 PBz:	B <sup>0</sup>	669 PSWpm:	$\tilde{W}^{\pm}$
616 PB:	B	670 PSZz:	$\tilde{Z}^0$
617 PDiz:	D <sub>1</sub> (2420) <sup>0</sup>	671 PSe:	$\tilde{e}$
618 PDm:	D <sup>-</sup>	672 PSgg:	$\tilde{\gamma}$
619 PDpm:	D <sup>±</sup>	673 PSgm:	$\tilde{\mu}$
620 PDp:	D <sup>+</sup>	674 PSgn:	$\tilde{\nu}$
621 PDstiz:	D <sub>2</sub> <sup>*</sup> (2460) <sup>0</sup>	675 PSgt:	$\tilde{\tau}$
622 PDstpm:	D <sup>*</sup> (2010) <sup>±</sup>	676 PSgxpm:	$\tilde{\chi}_i^{\pm}$
623 PDstz:	D <sup>*</sup> (2010) <sup>0</sup>	677 PSgxz:	$\tilde{\chi}_i^0$
624 PDz:	D <sup>0</sup>	678 PSg:	$\tilde{g}$
625 PD:	D	679 PSq:	$\tilde{q}$
626 PEz:	E <sup>0</sup>	680 PWR:	W <sub>R</sub>
627 PHpm:	H <sup>±</sup>	681 PWm:	W <sup>-</sup>
628 PHz:	H <sup>0</sup>	682 PWpr:	W'
629 PJgy:	J/ψ(1S)	683 PWp:	W <sup>+</sup>
630 PKeiii:	K <sub>e3</sub>	684 PW:	W
631 PKgmiii:	K <sub>μ3</sub>	685 PZLR:	Z <sub>LR</sub>
632 PKia:	K <sub>1</sub> (1400)	686 PZgc:	Z <sub>χ</sub>
633 PKii:	K <sub>2</sub> (1770)	687 PZge:	Z <sub>η</sub>
634 PKi:	K <sub>1</sub> (1270)	688 PZgy:	Z <sub>ψ</sub>
635 PKm:	K <sup>-</sup>	689 PZi:	Z <sub>1</sub>
636 PKpm:	K <sup>±</sup>	690 PZZ:	Z <sup>0</sup>
637 PKp:	K <sup>+</sup>	691 PaBz:	$\bar{B}^0$
638 PKsta:	K <sup>*</sup> (1370)	692 PaB:	$\bar{B}$
639 PKstb:	K <sup>*</sup> (1680)	693 PaDz:	$\bar{D}^0$
640 PKstiii:	K <sub>3</sub> <sup>*</sup> (1780)	694 PaD:	$\bar{D}$
641 PKstii:	K <sub>2</sub> <sup>*</sup> (1430)	695 PaKz:	$\bar{K}^0$
642 PKstiv:	K <sub>4</sub> <sup>*</sup> (2045)	696 PaSq:	$\bar{q}$
643 PKstz:	K <sub>0</sub> <sup>*</sup> (1430)	697 PagL:	$\bar{\Lambda}$
644 PKst:	K <sup>*</sup> (892)	698 PagOp:	$\bar{\Omega}^+$
645 PKzL:	K <sub>0</sub> <sup>0</sup>	699 PagSm:	$\bar{\Sigma}^-$
646 PKzS:	K <sub>S</sub> <sup>0</sup>	700 PagSp:	$\bar{\Sigma}^+$
647 PKzeiii:	K <sub>e3</sub> <sup>0</sup>	701 PagSz:	$\bar{\Sigma}^0$
648 PKzgmiii:	K <sub>3</sub> <sup>0</sup>	702 PagXp:	$\bar{\Xi}^+$
649 PKz:	K <sup>0</sup>	703 PagXz:	$\bar{\Xi}^0$
650 PK:	K	704 Pagne:	$\bar{\nu}_e$
651 PLpm:	L <sup>±</sup>	705 Pangm:	$\bar{\nu}_\mu$
652 PLz:	L <sup>0</sup>	706 Pangt:	$\bar{\nu}_\tau$
653 PN:	N	707 Paii:	a <sub>2</sub> (1320)
654 PNa:	N(1440)P <sub>11</sub>	708 Pai:	a <sub>1</sub> (1260)
655 PNb:	N(1520)D <sub>13</sub>	709 Pap:	$\bar{p}$
656 PNc:	N(1535)S <sub>11</sub>	710 Paqb:	$\bar{q}_b$
657 PNd:	N(1650)S <sub>11</sub>	711 Paqc:	$\bar{q}_c$
658 PNe:	N(1675)D <sub>15</sub>	712 Paqd:	$\bar{q}_d$
659 PNf:	N(1680)F <sub>15</sub>	713 Paqs:	$\bar{q}_s$
660 PNG:	N(1700)D <sub>13</sub>	714 Paqt:	$\bar{q}_t$
661 PNh:	N(1710)P <sub>11</sub>	715 Paqu:	$\bar{q}_u$
662 PNi:	N(1720)P <sub>13</sub>	716 Paq:	$\bar{q}$
663 PNj:	N(2190)G <sub>17</sub>	717 Paz:	a <sub>0</sub> (980)
664 PNk:	N(2220)H <sub>19</sub>		

718	Pbgcia:	$\chi_{b1}(2P)$	774	PgO:	$\Omega$
719	Pbgciia:	$\chi_{b2}(2P)$	775	PgOm:	$\Omega^-$
720	Pbgcii:	$\chi_{b2}(1P)$	776	PgOma:	$\Omega(2250)^-$
721	Pbgci:	$\chi_{b1}(1P)$	777	PgS:	$\Sigma$
722	Pbgcza:	$\chi_{b0}(2P)$	778	PgSa:	$\Sigma(1385)P_{13}$
723	Pbgcz:	$\chi_{b0}(1P)$	779	PgSb:	$\Sigma(1660)P_{11}$
724	Pbi:	$b_1(1235)$	780	PgSc:	$\Sigma(1670)D_{13}$
725	PcgLp:	$\Lambda_c^+$	781	PgSd:	$\Sigma(1750)S_{11}$
726	PcgS:	$\Sigma_c(2455)$	782	PgSe:	$\Sigma(1775)D_{15}$
727	PcgXp:	$\Xi_c^+$	783	PgSf:	$\Sigma(1915)F_{15}$
728	PcgXz:	$\Xi_c^0$	784	PgSg:	$\Sigma(1940)D_{13}$
729	Pcgcii:	$\chi_{c2}(1P)$	785	PgSh:	$\Sigma(2030)F_{17}$
730	Pcgci:	$\chi_{c1}(1P)$	786	PgSi:	$\Sigma(2050)$
731	Pcgcz:	$\chi_{c0}(1P)$	787	PgSm:	$\Sigma^-$
732	Pcgh:	$\eta_c(1S)$	788	PgSp:	$\Sigma^+$
733	Pem:	$e^-$	789	PgSz:	$\Sigma^0$
734	Pep:	$e^+$	790	PgU:	$Y$
735	Pe:	$e$	791	PgUa:	$Y(1S)$
736	Pfia:	$f_1(1390)$	792	PgUb:	$Y(2S)$
737	Pfib:	$f_1(1510)$	793	PgUc:	$Y(3S)$
738	Pfiai:	$f_2(1720)$	794	PgUd:	$Y(3S)$
739	Pfiib:	$f_2(2010)$	795	PgUe:	$Y(10860)$
740	Pfiic:	$f_2(2300)$	796	PgUf:	$Y(11020)$
741	Pfiid:	$f_2(2340)$	797	PgX:	$\Xi$
742	Pfiipr:	$f_2(1525)$	798	PgXa:	$\Xi(1530)P_{13}$
743	Pfii:	$f_2(1270)$	799	PgXb:	$\Xi(1690)$
744	Pfiv:	$f_4(2050)$	800	PgXc:	$\Xi(1820)D_{13}$
745	Pfi:	$f_1(1285)$	801	PgXd:	$\Xi(1950)$
746	Pfza:	$f_0(1400)$	802	PgXe:	$\Xi(2030)$
747	Pfzb:	$f_0(1590)$	803	PgXm:	$\Xi^-$
748	Pfz:	$f_0(975)$	804	PgXz:	$\Xi^0$
749	PgD:	$\Delta$	805	Pgfa:	$\phi(1680)$
750	PgDa:	$\Delta(1232)P_{33}$	806	Pgfiii:	$\phi_3(1850)$
751	PgDb:	$\Delta(1620)S_{31}$	807	Pgf:	$\phi(1020)$
752	PgDc:	$\Delta(1700)D_{33}$	808	Pgg:	$\gamma$
753	PgDd:	$\Delta(1900)S_{31}$	809	Pgha:	$\eta(1295)$
754	PgDe:	$\Delta(1905)F_{35}$	810	Pghb:	$\eta(1440)$
755	PgDf:	$\Delta(1910)P_{31}$	811	Pghpr:	$\eta'(958)$
756	PgDh:	$\Delta(1920)P_{33}$	812	Pgh:	$\eta$
757	PgDi:	$\Delta(1930)D_{35}$	813	Pgmm:	$\mu^-$
758	PgDj:	$\Delta(1950)F_{37}$	814	Pgmp:	$\mu^+$
759	PgDk:	$\Delta(2420)H_{3,11}$	815	Pgmi:	$\mu$
760	PgL:	$\Lambda$	816	Pgne:	$\nu_e$
761	PgLa:	$\Lambda(1405)S_{01}$	817	Pngm:	$\nu_\mu$
762	PgLb:	$\Lambda(1520)D_{03}$	818	Pngt:	$\nu_\tau$
763	PgLc:	$\Lambda(1600)P_{01}$	819	Pgoa:	$\omega(1390)$
764	PgLd:	$\Lambda(1670)S_{01}$	820	Pgob:	$\omega(1600)$
765	PgLc:	$\Lambda(1690)D_{03}$	821	Pgoiii:	$\omega_3(1670)$
766	PgLf:	$\Lambda(1800)S_{01}$	822	Pgo:	$\omega(783)$
767	PgLg:	$\Lambda(1810)P_{01}$	823	Pgpa:	$\pi(1300)$
768	PgLh:	$\Lambda(1820)F_{05}$	824	Pgpii:	$\pi_2(1670)$
769	PgLl:	$\Lambda(1830)D_{05}$	825	Pgpm:	$\pi^-$
770	PgLj:	$\Lambda(1890)P_{03}$	826	Pgpmp:	$\pi^\pm$
771	PgLk:	$\Lambda(2100)G_{07}$	827	Pgpmp:	$\pi^+$
772	PgLl:	$\Lambda(2110)F_{05}$	828	Pgpz:	$\pi^0$
773	PgLm:	$\Lambda(2350)H_{09}$			

829	Pgp:	$\pi$	838	PBzs:	$B_s^0$
830	Pgra:	$\rho(1450)$	839	Pg:	$g$
831	Pgrb:	$\rho(1700)$	840	PSg:	$\tilde{g}$
832	Pgriii:	$\rho_3(1690)$	841	PSQ:	$\tilde{q}$
833	Pgr:	$\rho(770)$	842	PXXG:	$G$
834	Pgt:	$\tau$	843	PXXSG:	$\tilde{G}$
835	Pgya:	$\psi(3770)$	844	PSGcp:	$\tilde{\chi}^+$
836	Pgyb:	$\psi(4040)$	845	PSGc:	$\tilde{\chi}$
837	Pgyc:	$\psi(4160)$	846	PSGcz:	$\tilde{\chi}^0$
838	Pgyd:	$\psi(4415)$	847	PSGczDo:	$\tilde{\chi}_1^0$
839	Pgy:	$\psi(2S)$	848	PSGczDt:	$\tilde{\chi}_2^0$
840	Phia:	$h_1(1170)$	849	PSGcpm:	$\tilde{\chi}^\pm$
841	Pn:	n	850	Pl:	$l$
842	Pp:	p	851	PAI:	$\bar{l}$
843	Pqb:	$q_b$	852	PGnl:	$v_1$
844	Pqc:	$q_c$	853	PAGnl:	$\bar{v}_1$
845	Pqd:	$q_d$	854	PQtpr:	$t'$
846	Pqs:	$q_s$	855	PAQtpr:	$\bar{t}'$
847	Pqt:	$q_t$	856	PQbpr:	$b'$
848	Pqu:	$q_u$	857	PAQbpr:	$\bar{b}'$
849	Pq:	q	858	PGg:	$\gamma$
850	PsDipm:	$D_{s1}(2536)^\pm$	859	PKzS:	$K_S^0$
851	PsDm:	$D_s^-$	860	PBs:	$B_s$
852	PsDp:	$D_s^+$	861	PSQt:	$\tilde{t}$
853	PsDst:	$D_s^*$	862	PZpr:	$Z'$
854	Future PENNAMES		863	PGn:	$\nu$
855	PH:	H	864	PAGn:	$\bar{\nu}$
856	PJGy:	J/ $\psi$	865		

include \xspace

## 886 C OS X specific instructions

- 887 These instructions are based on a clean installation of Mac OS X 10.7.3 (Lion). This release has  
 888 current versions of both perl and svn.
- 889 Download the TeXLive 2011 installation, <http://mirror.ctan.org/systems/mac/mactex/MacTeX.mpkg.zip>, and install (if not already done). This is a relatively large installation.
- 890 If a simple `kinit Your_CERN_Username@CERN.CH` doesn't allow you to access the svn repository  
 891 in the standard fashion, you can follow the instructions at <http://svn.web.cern.ch svn/ howto.php#accessing-sshlinux> to set up an ssh key pair. I tried using the keychain, but  
 892 it isn't supported in the included version of svn. There are commercial versions available with  
 893 GUIs, and maybe even free versions—I didn't look very hard—but they are not necessary.
- 894 Then follow the general instructions in [https://svnweb.cern.ch/cern/wsvn/tdr2/papers/XXX-08-000/trunk/XXX-08-000\\_temp.pdf](https://svnweb.cern.ch/cern/wsvn/tdr2/papers/XXX-08-000/trunk/XXX-08-000_temp.pdf) (this document) and [https://svnweb.cern.ch/cern/wsvn/tdr2/utils/trunk/general/notes\\_for\\_authors.pdf](https://svnweb.cern.ch/cern/wsvn/tdr2/utils/trunk/general/notes_for_authors.pdf).
- 895 Additional style files are required to generate documents in the journal formats, and many of  
 896 these need to be installed individually.